Experiment No.: 02

Name of the Experiment: Experimental Study of look up tables, MATLAB Function and Verify Output

Required Software:

- MATLAB
- Simulink

Objectives:

- To know about 1D and 2D lookup table and their use
- To know about MATLAB Function block and its significance
- To verify output of particular problem with MATLAB function and Simulink block

1-D Look up Table:

A Tabulated Data is given for alternator where X= field Current and Y=Terminal Voltage

Field Current If =X	Terminal Voltage Vt = Y
.43	104
.48	116
.53	134
.58	148
.63	158
.68	180
.73	196
.78	228
.83	235
.88	252

This tabulated data is used in 1D lookup table and taking the input the corresponding output can be seen in the display and verified.

Circuit Diagram:

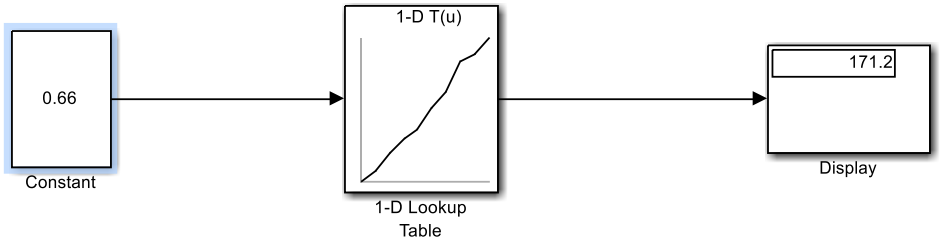

Figure 2.1.: Circuit Diagram of 1D look up Table using Simulink

2-D Look up Table: Tabular data is an Admittance matrix data from power system and for particular row and column the output is verified.

Circuit Diagram:

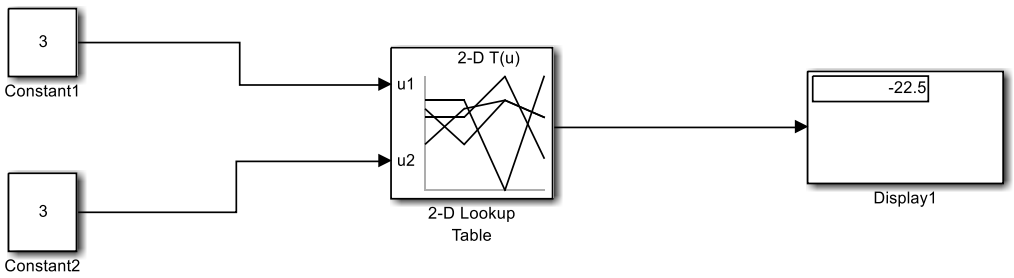

Figure 2.2: Circuit Diagram of 2D look up Table using Simulink

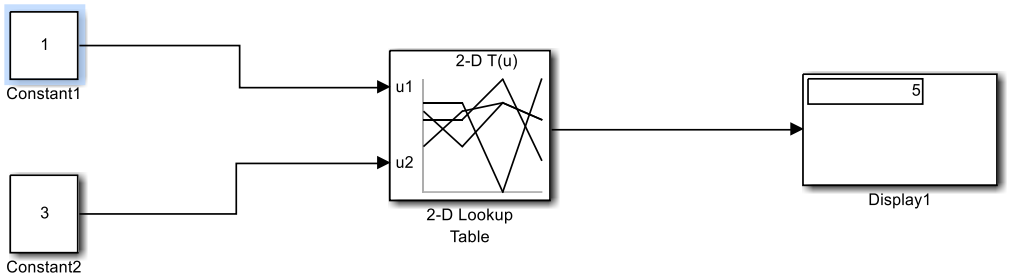

Figure 2.3.: Circuit Diagram of 2D look up Table using Simulink

Solution of Given Problem in Simulink:

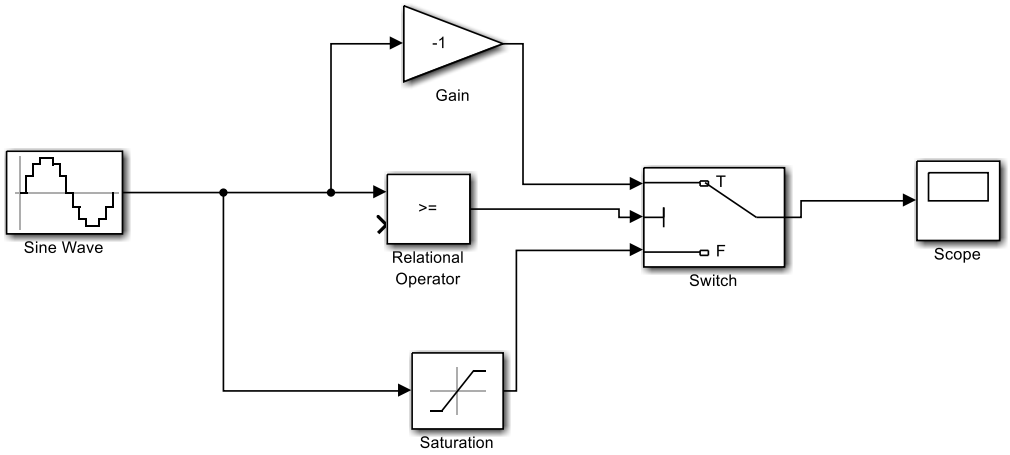

Figure 2.4.: Circuit diagram to solve given problem in the lab

Output:

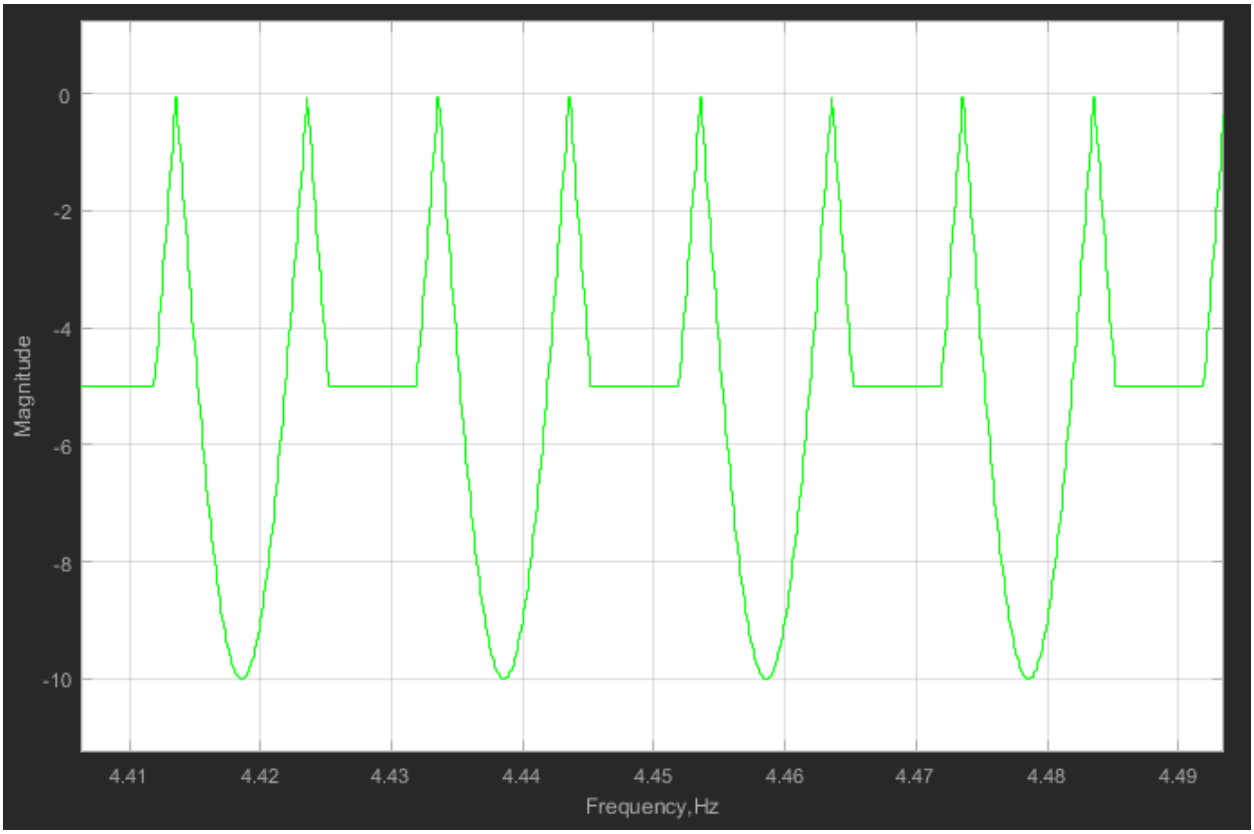

Figure 2.5: Output of the given experimental problem using Simulink

Alternate Solution Using MATLAB function Block:

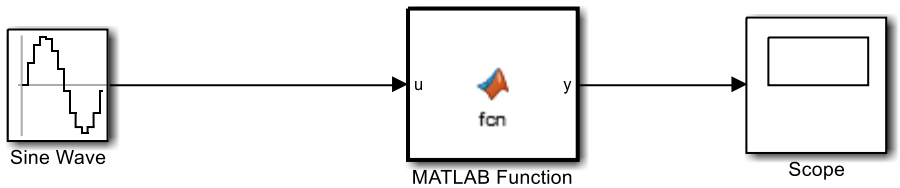

Figure 2.6: Circuit Diagram using MATLAB function

MATLAB Function

```
function y = fcn(u)
%#codegen
%% checking the condition of the wave
if (u>=0)
  y = -u;
elseif (u<0)&& (u < -5)
    y = -5;
else
    y = u;
end
end
```

Figure 2.7: MATLAB Function internal code

Output:

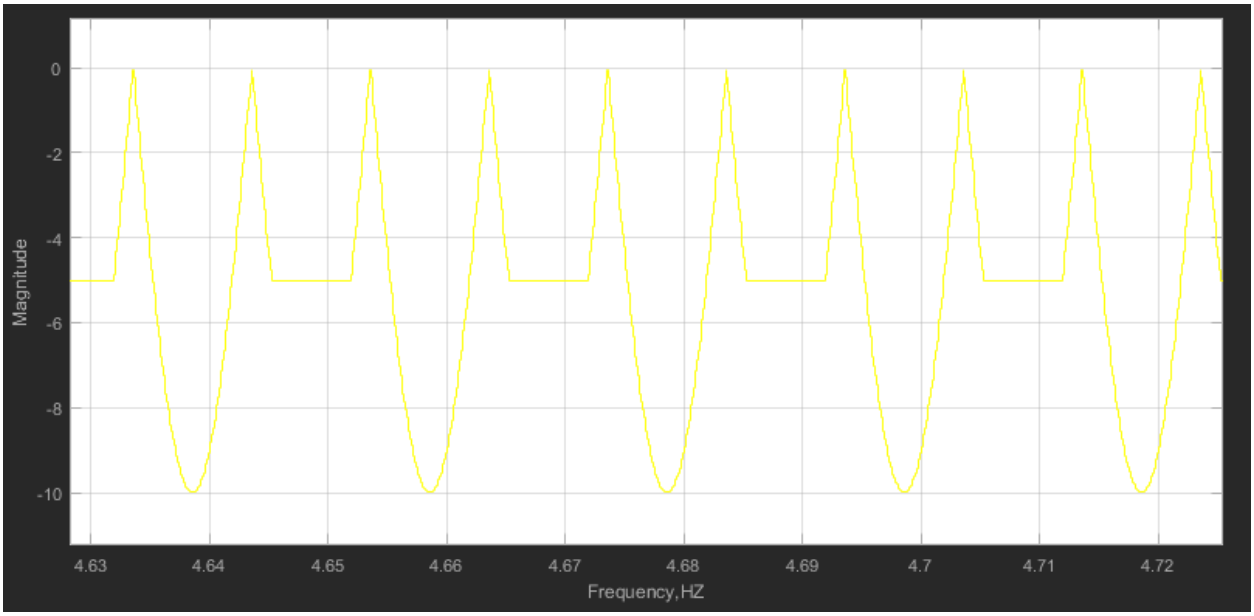

Figure 2.8: Output of Given Experimental Problem using MATLAB Function block